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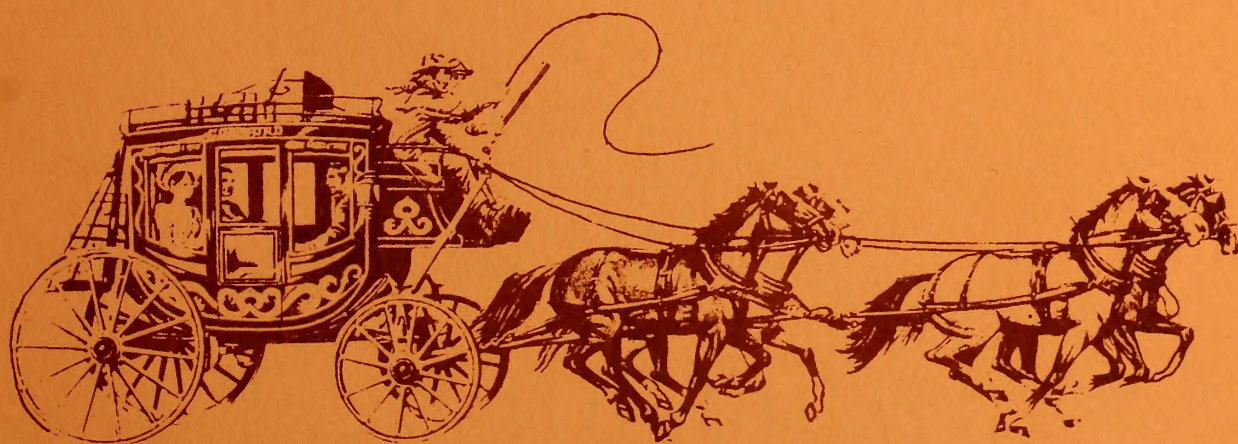
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# *Rolesville Thoroughfare Plan*



September, 1988





ROLESVILLE  
THOROUGHFARE PLAN

PREPARED BY:

THOROUGHFARE PLANNING UNIT  
STATEWIDE PLANNING GROUP  
PLANNING AND RESEARCH BRANCH  
DIVISION OF HIGHWAYS  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

IN COOPERATION WITH:

THE TOWN OF ROLESVILLE  
THE FEDERAL HIGHWAY ADMINISTRATION  
U. S. DEPARTMENT OF TRANSPORTATION

SEPTEMBER 1988

PERSONS RESPONSIBLE FOR THIS REPORT:

MANAGER PLANNING AND RESEARCH:	J. M. Greenhill, P.E.
ASST. MANAGER PLANNING AND RESEARCH:	M. R. Poole, Ph.D., P.E.
THOROUGHFARE PLANNING ENGINEER:	J. T. Newnam, P.E.
PROJECT ENGINEER:	R. J. Booker, III
PROJECT TECHNICIAN:	Elizabeth Honeycutt







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## I. INTRODUCTION

A preliminary thoroughfare plan for Rolesville was adopted by the Town of Rolesville on October 5, 1987, and by the North Carolina Department of Transportation on November 13, 1987. The plan was jointly developed by the Planning and Research Branch of the North Carolina Department of Transportation (NCDOT) and the Town of Rolesville. The Rolesville Thoroughfare Plan is dated September 8, 1987, and is kept on file at the Thoroughfare Planning Branch of the NCDOT.

A thoroughfare plan is developed to ensure an efficient street system for the locality and to ensure continuity between local street systems and our statewide network. The purpose of this report is to document findings and recommendations to accompany the 1987 Rolesville Thoroughfare Plan. Included are recommendations for Thoroughfare cross sections, cost estimates for recommended improvements, an evaluation of the benefits to be gained from improvements, and recommendations for plan implementation.

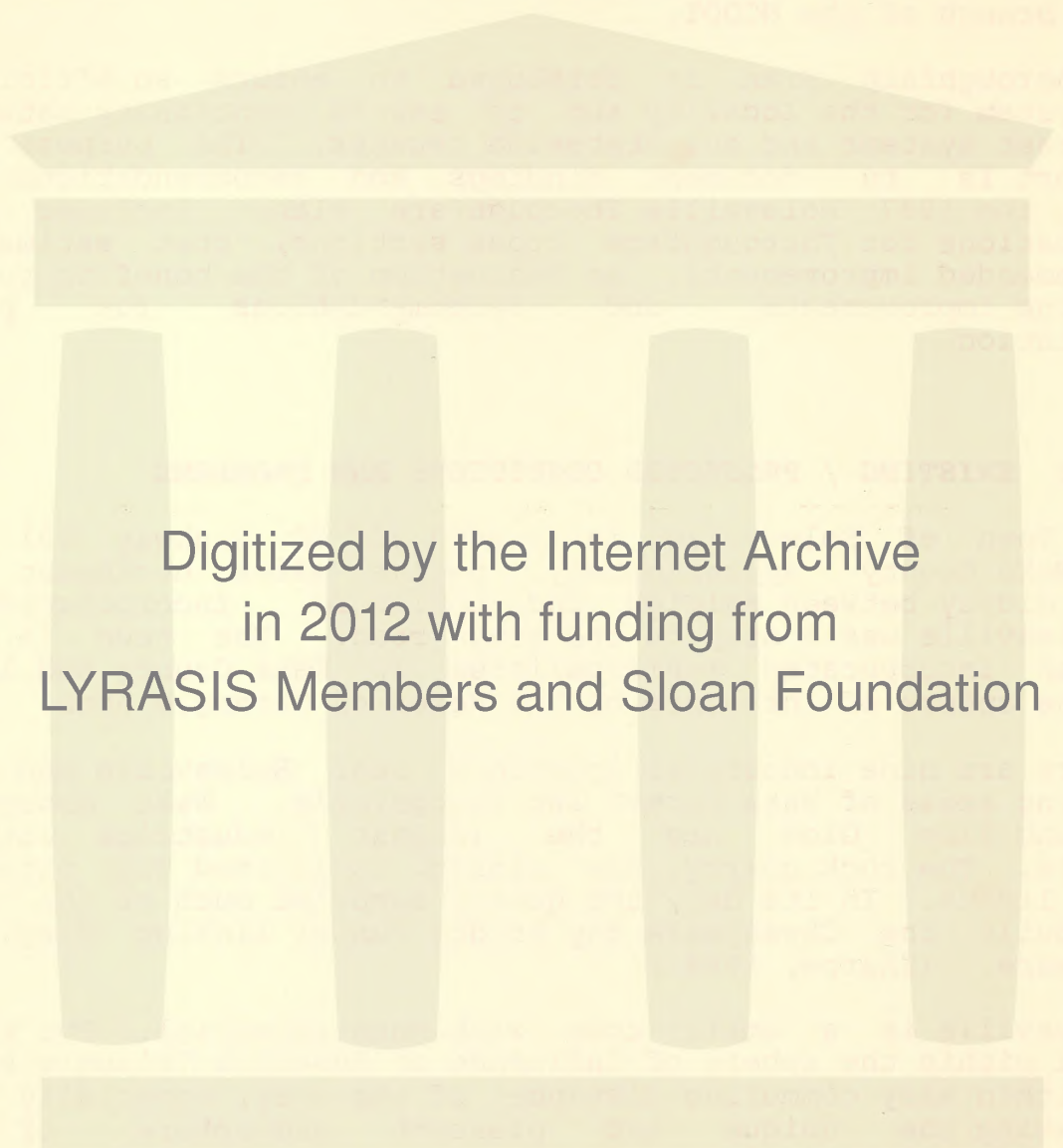
## II. EXISTING / PROJECTED CONDITIONS AND PROBLEMS

The Town of Rolesville is located off US Highway 401 in Eastern Wake County approximately twelve miles northeast of Raleigh, midway between Raleigh and Louisburg. Incorporated in 1837, Rolesville was a stop on the stage road. The town is now one of ten incorporated municipalities in Wake County and lies within the sphere of influence of the Research Triangle Area.

There are nine industrial locations near Rolesville and the neighboring areas of Wake Forest and Youngsville. Wake Monument Company and Pine Glow are the largest industries within Rolesville. The rock quarry, now closed, is located just outside the town limits. In its day, the quarry supplied much of the rock used to built the Chesapeake Bay Bridge Tunnel linking Virginia and Delaware. (Sharpe, 1964.)

Rolesville is a small town with much potential. The town lies well within the sphere of influence of Research Triangle Park and is within easy commuting distance of the area, especially for those seeking the unique and pleasant atmosphere of a residential/rural community.

Population growth within the Rolesville township has not been constant. A steady increase from 1950 until 1970 was followed by a 28.5 percent decrease in population from 1970 until 1980 according to data gathered by the U. S. Census Bureau. (See Table 1 and 2.)



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TABLE 1. POPULATION DATA				
Year	Rolesville	Wake Forest	Raleigh	Youngsville
1950	288	3,704	65,071	619
1960	358	2,664	85,768	596
1970	533	3,148	121,577	551
1980	381	3,780	150,255	486

Source: U. S. Census of Population, 1950, 1960, 1970, and 1980.

Population in the surrounding towns and cities has been increasing as has the Wake County population as a whole; this trend is expected to continue. (See Figure 1.) Triangle and Wake Forest commuters will continue to increase Rolesville's population. Extrapolating current data to the year 2010, Rolesville's population is estimated to be 700.

TABLE 2. POPULATION DATA - PERCENT INCREASE				
Year	Rolesville	Wake Forest	Raleigh	Youngsville
1950-60	24.3	28.1	31.8	- 3.7
1960-70	48.9	18.2	41.7	- 7.6
1970-80	- 28.5	20.1	23.6	- 11.8

The current population of Rolesville as of a 1987 according to the Office of the State Budget is 584, a 53.3 percent increase (partly due to annexation) over the 1980 population count.

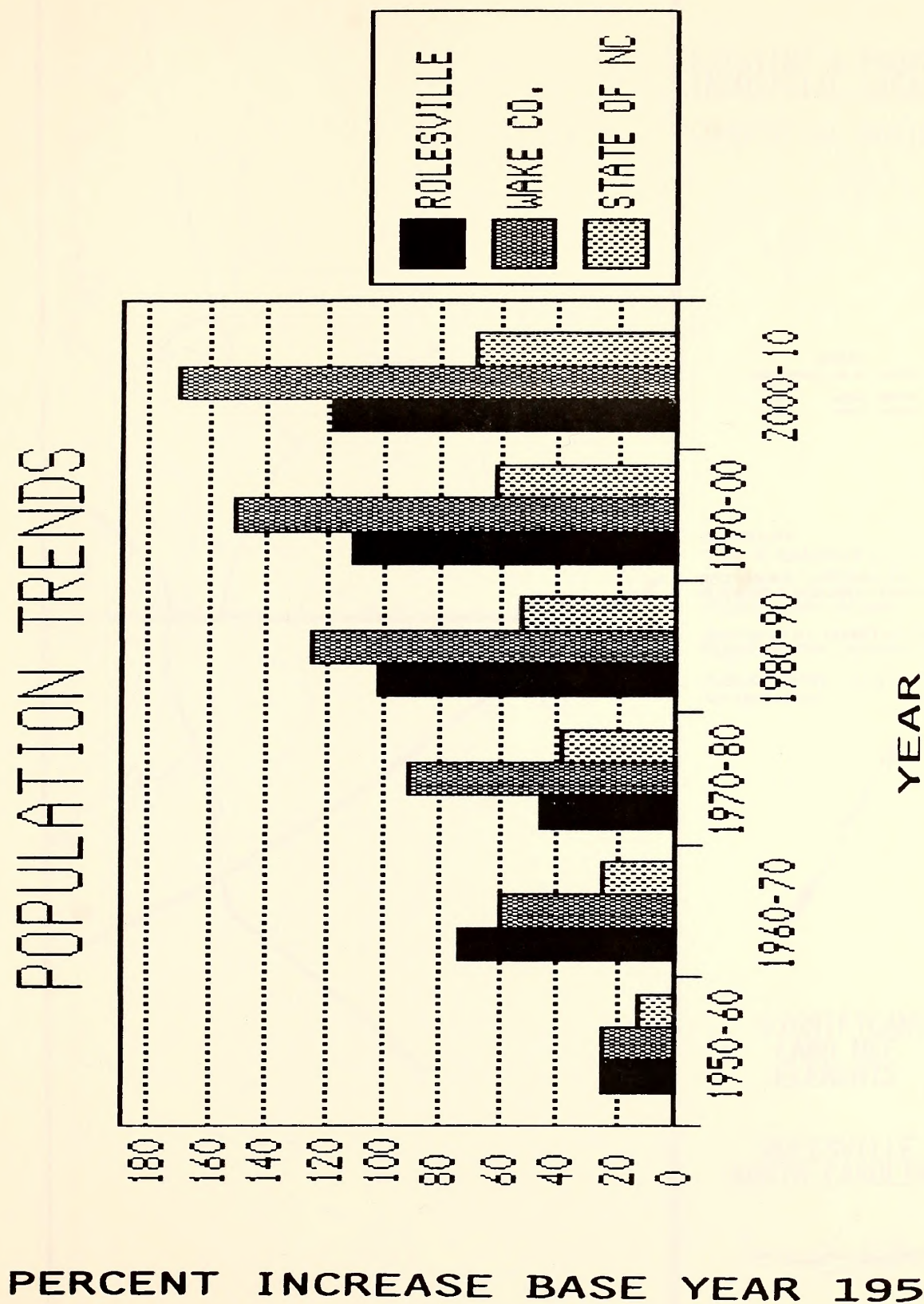
Residential development is planned in the southeast and northwest areas of the Town of Rolesville just outside town limits, with some lesser development occurring off Rogers Road. Commercial development is expected to occur on the south side of US 401 between Burlington Mill Road and Rogers Road, industry exists and is being encouraged on the north side of US 401 within the same boundaries. Rolesville Elementary School is located at the intersection of Rogers Road and School Street on US 401. The fire station, rescue squad, and Town Hall are located downtown at the intersection of Young Street and US 401. (See Figure 2.)

NOTE: For more information on land use consult the June 1985, Land Use Plan for the Town of Rolesville, NC, published by the NC Division of Community Assistance.



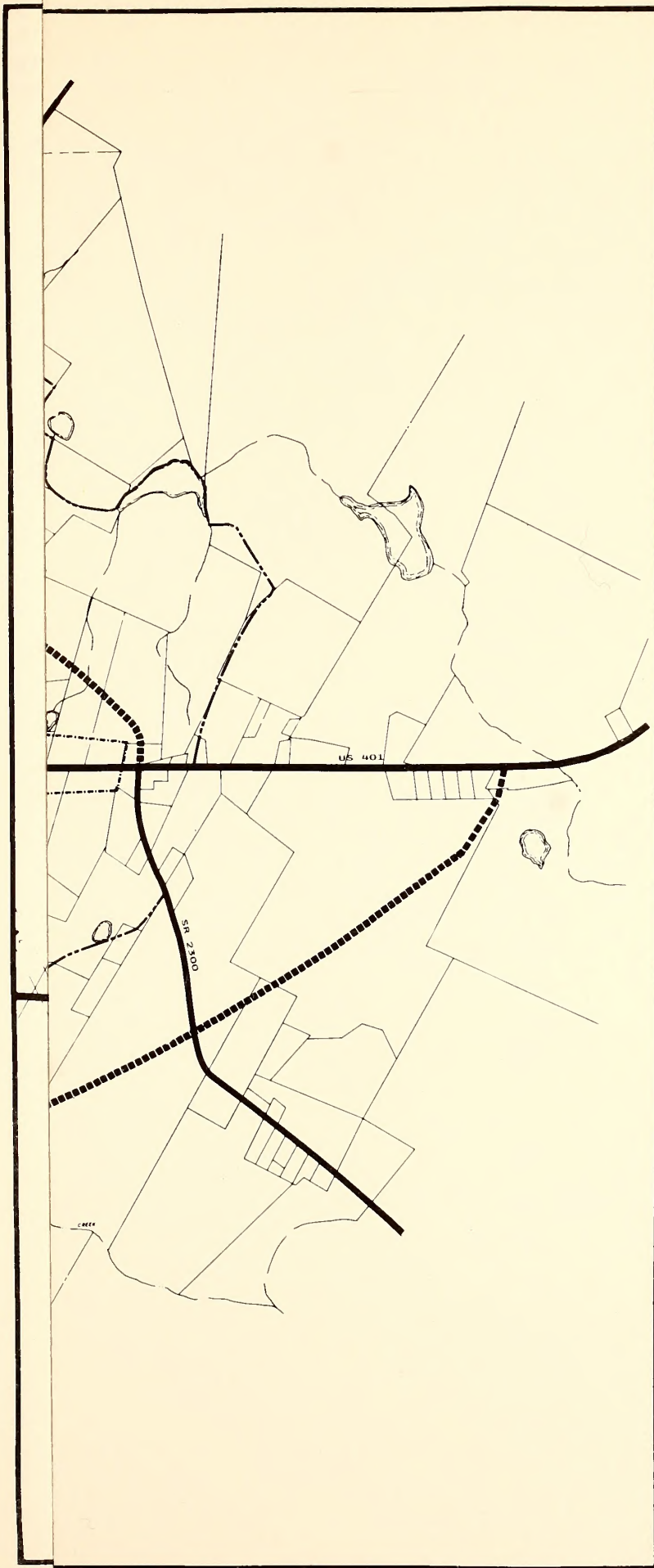


FIGURE 1









RESIDENTIAL GROWTH  
AREAS

PUBLIC LAND USE

EXISTING & PROPOSED  
INDUSTRIAL AREAS

COMMERCIAL BUSINESS

LEGEND

THOROUGHFARES	EXISTING	PROPOSED
FREEWAYS	————	————
MAJOR	————	————
MINOR	————	————

ADOPTED BY:  
TOWN OF ROLESVILLE OCTOBER 5, 1987

RECOMMENDED APPROVAL BY  
PLANNING & RESEARCH BRANCH  
OCTOBER 23, 1987 *W. Robinson*

ADOPTED BY N.C. DEPARTMENT OF  
TRANSPORTATION NOVEMBER 13, 1987

PUBLIC HEARING HELD ON  
SEPTEMBER 8, 1987



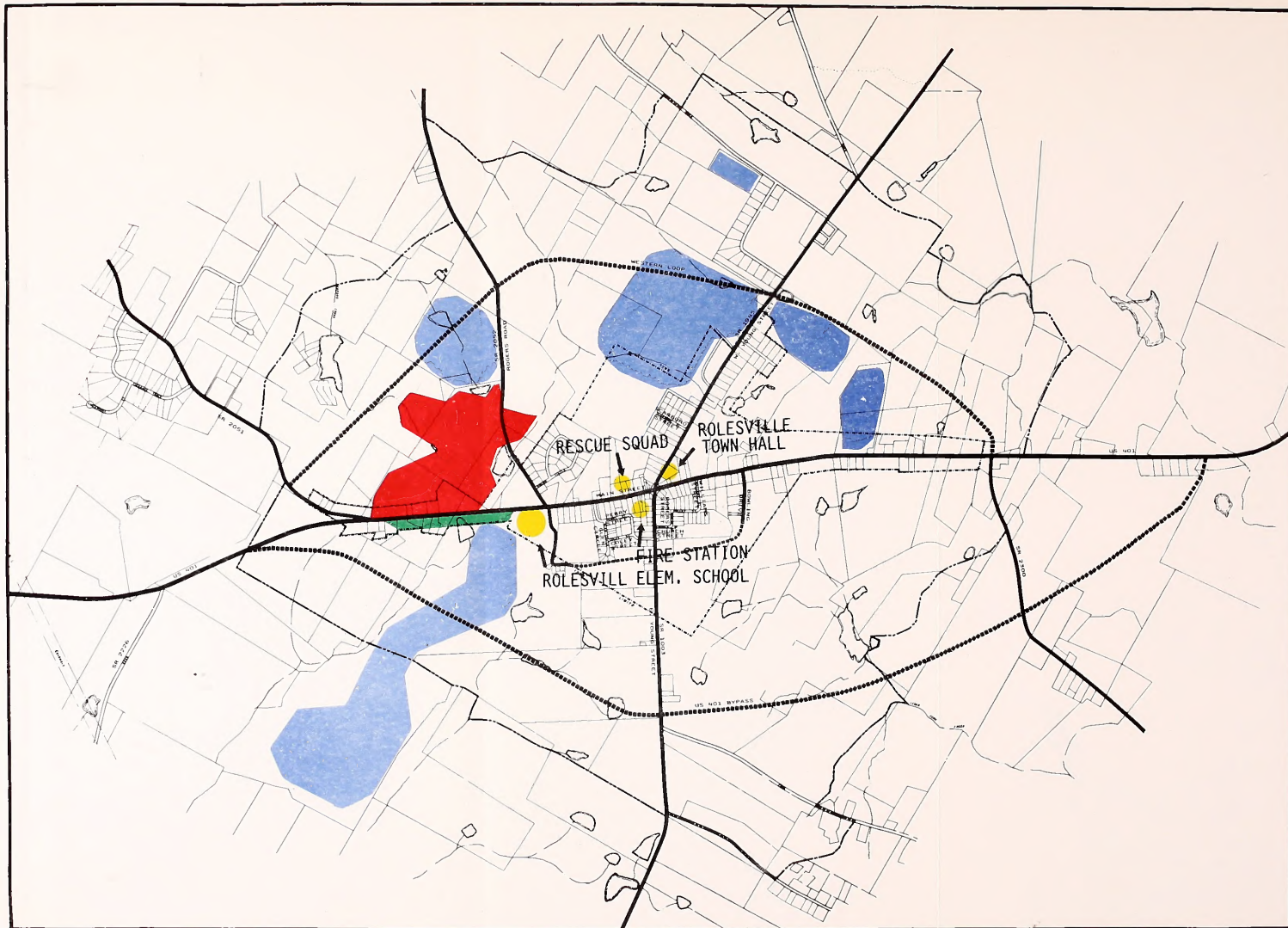
SIGNIFICANT  
LAND USE  
ELEMENTS

ROLESVILLE  
NORTH CAROLINA



FIGURE 2





RESIDENTIAL GROWTH  
AREAS

PUBLIC LAND USE

EXISTING & PROPOSED  
INDUSTRIAL AREAS

COMMERCIAL BUSINESS

LEGEND  
 THUNDERBOLTS, DASHES, THICK LINES  
 FREWAYS  
 MAJOR  
 WATER

ADOPTED BY:  
TOWN OF ROLESVILLE OCTOBER 5, 1987

RECOMMENDED APPROVAL BY  
PLANNING & RESEARCH BRANCH  
OCTOBER 23, 1987

ADOPTED BY N.C. DEPARTMENT OF  
TRANSPORTATION NOVEMBER 13, 1987

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SEPTEMBER 6, 1987



SIGNIFICANT  
LAND USE  
ELEMENTS

ROLESVILLE  
NORTH CAROLINA



FIGURE 2





The Town of Rolesville's request for a thoroughfare plan was mainly a result of traffic congestion occurring at Rolesville Elementary School. This and other traffic flow problems are identified below.

- Rolesville Elementary School. Congestion is created at the intersection of US 401 and School Road by morning and afternoon traffic (parents/buses) needing to make a left turn onto School Road.
- Intersection of Rogers and School Road with US 401. An offset intersection exists where Rogers' and School Road meet on U. S. 401.
- Intersection of U. S. 401 with East and West Young Streets. Traffic flow becomes congested here, during morning & evening peak traffic flow.





### III. ROLESVILLE THOROUGHFARE PLAN

The 1987 Rolesville Thoroughfare Plan was developed to provide the City and State guidance as to how the major street system should be developed in order to meet existing and future travel desires. Other objectives of the plan are (1) to ensure the development of a coordinated major street system as land development occurs; (2) to reduce travel and transportation costs to the public; (3) to reduce public cost for major street improvement through coordination of the street system with private action; (4) to enable private interests to plan their actions, improvements, and development with full knowledge of public interest; (5) to minimize disruption and displacement of people and business; (6) to reduce transportation environmental impacts; and (7) to increase travel safety.

A basic concept of thoroughfare planning is that a functional system of streets be provided which permit travel from origins to destinations with directness, ease, and safety. Streets in the system are designed to perform different functions to minimize traffic and land service conflicts. Local access streets which may be further classified as residential, commercial, or industrial streets are designed only to provide access to abutting property. Minor thoroughfares are more important streets in a city system and are designed to collect traffic from local access streets and carry it to the major thoroughfare system. They may also serve abutting property and serve some minor through traffic movements. The major thoroughfares are the primary traffic arteries of the city providing for traffic movements within, around, and through the area.

A coordinated system of major thoroughfares which is most adaptable to desire lines of travel within an urban area is the radial-loop system. The radial-loop system includes radials, crosstowns, loops and bypasses. Radial thoroughfares provide for travel from points outside to major destinations inside the city. Crosstown thoroughfares provide for travel from points outside to major destinations inside the city. Crosstown thoroughfares provide for traffic movements across the central area and around the CBD. Loop thoroughfares provide for lateral travel movement between suburban areas. Bypasses are designed to carry non local traffic around or through the area. Occasionally a bypass with low through traffic volumes can be designed to function as a portion of an urban loop. The radial-loop major thoroughfare system concept and concept of functionally classified urban street system are illustrated in Figure 3.

The Rolesville Thoroughfare Plan is designed to solve both existing and projected traffic movement problems in the Rolesville Area. (See Figure 4, Rolesville Thoroughfare Plan, and Figure 5 for a summation of the average present and estimate future daily traffic). Major and minor thoroughfare recommendations are tabulated in Appendix A and described as follows:

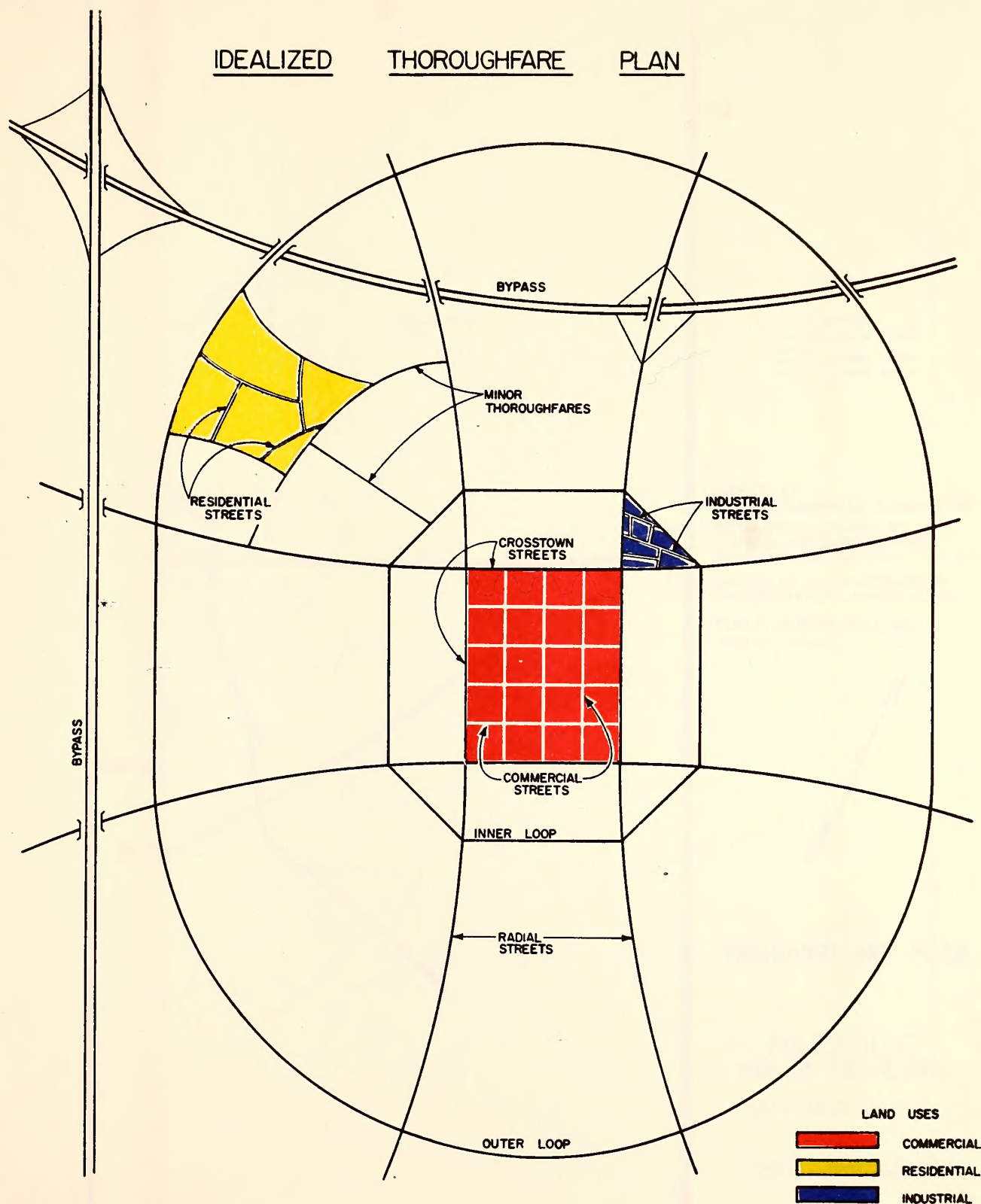
#### Major Thoroughfare System

The Rolesville major thoroughfare system includes a proposed US 401 Bypass, the proposed Western Loop, and existing US 401.

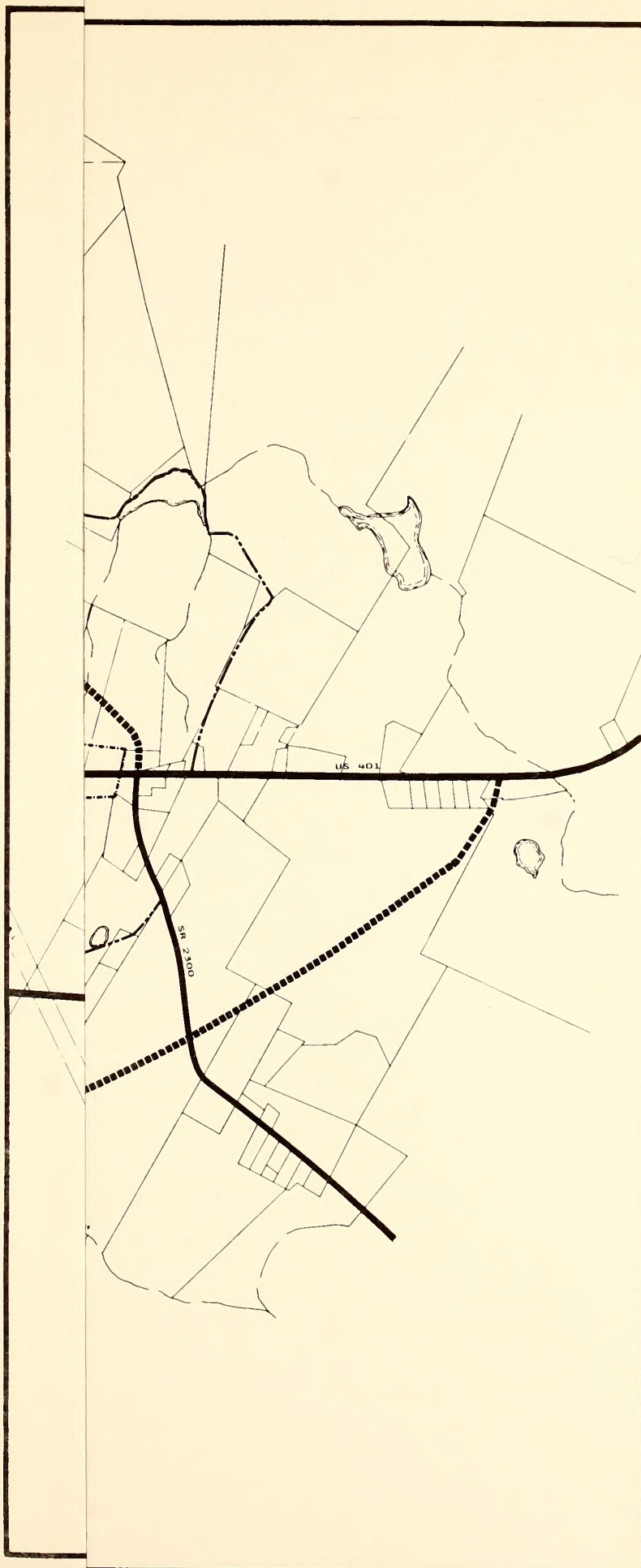




FIGURE 3







LEGEND

THOROUGHFARES	EXISTING	PROPOSED
FREWAYS		=====
MAJOR	—————	=====
MINOR	—————	=====

ADOPTED BY:  
TOWN OF ROLESVILLE OCTOBER 5, 1987

RECOMMENDED APPROVAL BY  
PLANNING & RESEARCH BRANCH  
OCTOBER 23, 1987 *H. Johnson*

ADOPTED BY N.C. DEPARTMENT OF  
TRANSPORTATION NOVEMBER 13, 1987

PUBLIC HEARING HELD ON  
SEPTEMBER 8, 1987



## THOROUGHFARE PLAN

ROLESVILLE  
NORTH CAROLINA

SEPTEMBER 8, 1987



FIGURE 4







# LEGEND

THOROUGHFARE EXISTING PROPOSED  
 OTHER  
 ROAD  
 ROAD

ADOPTED BY:  
 TOWN OF ROLESVILLE OCTOBER 5, 1987

RECOMMENDED APPROVAL BY  
 PLANNING & RESEARCH BRANCH  
 OCTOBER 23, 1987 *Adopted*

ADOPTED BY N.C. DEPARTMENT OF  
 TRANSPORTATION NOVEMBER 13, 1987

PUBLIC HEARING HELD ON  
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## THOROUGHFARE PLAN

ROLESVILLE  
 NORTH CAROLINA

SEPTEMBER 8, 1987

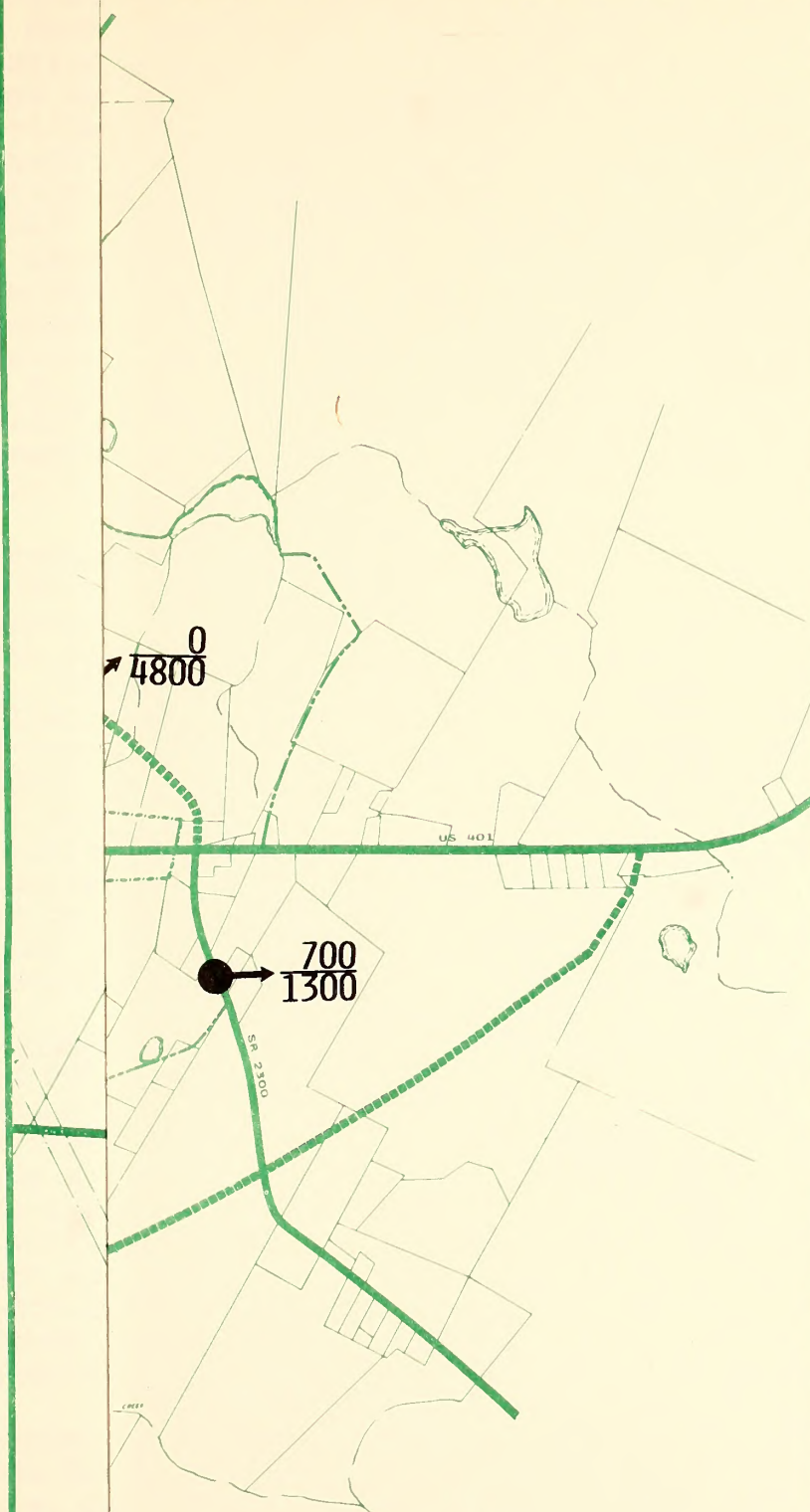


FIGURE 4





# AGE DAILY TRAFFIC - PRESENT VS FUTURE



**LEGEND**  
 THOROUGHFARES - DASHED  
 FREEWAYS - SOLID  
 MAJOR - THICK SOLID  
 MINOR - THIN SOLID

**PRESENT - 1987**  
**FUTURE - 2010**

ADOPTED BY:  
 TOWN OF ROLESVILLE OCTOBER 5, 1987

RECOMMENDED APPROVAL BY  
 PLANNING & RESEARCH BRANCH  
 OCTOBER 23, 1987 *[Signature]*

ADOPTED BY N.C. DEPARTMENT OF  
 TRANSPORTATION NOVEMBER 13, 1987

PUBLIC HEARING HELD ON  
 SEPTEMBER 8, 1987

**TRAFFIC PROJECTIONS**

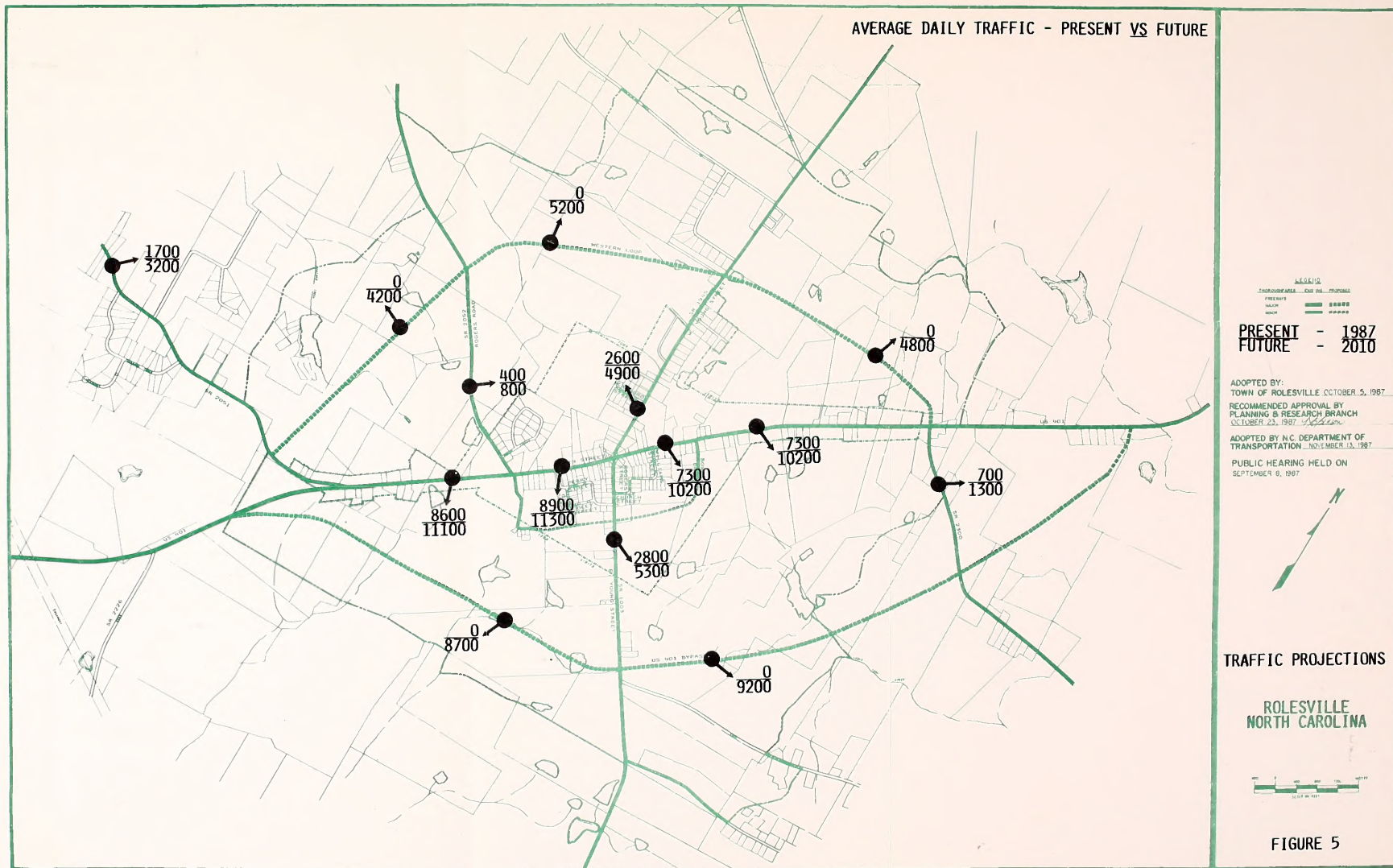
**ROLESVILLE  
 NORTH CAROLINA**

0 400 800 1200 1600  
 FEET  
 SCALE IN FEET

**FIGURE 5**











Existing US 401 - Existing US 401, known as Main Street within town limits, is the town's primary and busiest thoroughfare. Both residential and commercial development exist along both sides of US 401 through the Town of Rolesville. Congestion on US 401 has created some problems. Traffic flow is impeded by parents and buses attempting to make a left turn into Rolesville Elementary School. In the downtown area, at the intersection of US 401 and Young Streets, pedestrians have difficulty crossing the street because of traffic. The addition of a left turn lane in front of the elementary school is currently under construction. A widening of US 401 to 44 feet within the entire planning area (one mile outside town limits) is recommended. This proposed widening would necessitate the acquisition of an additional twenty feet of right-of-way along US 401. At the intersection of US 401 and Young Streets, crosswalks, rechannelization of the intersection, and resignalization are recommended to provide for greater pedestrian safety and improved traffic flow.

Proposed US 401 Bypass - The proposed US 401 Bypass is designed to provide relief for congestion on existing US 401. The bypass will also serve as a loop thoroughfare providing for lateral traffic movements between suburban areas in the North and South. The proposed bypass will begin at US 401 just south of the town limits, intersect East Young Street (SR 1003) approximately 4,000 feet east of downtown Rolesville, intersect Pulley Town Road (SR 2300) approximately 2,800 feet east of US 401, and connect to US 401 north of town limits. A four lane divided urban boulevard with limited control of access to abutting property will eventually provide travel service in the Rolesville area. It should be noted that the US 401 Bypass is a long term goal, and that the previously recommended widening of existing US 401 will be adequate well into the future.

Proposed Western Loop - The proposed Western Loop would extend Pulley Town Road (SR 2300), intersect West Young Street, and connect to Rogers Road (SR 2052), west of US 401. The loop would improve circulation in the northwestern area of Rolesville, provide a connector road between Rogers and Pulley Town Road, and reduce traffic somewhat on US 401. A two lane urban facility, with parking is the recommended cross section for the proposed Western Loop. The original proposal of having the western loop tie into US 401 at the south end of town was rejected due to the fact that the facility might draw through traffic into areas intended for residential use.

Other major thoroughfares in the Rolesville Thoroughfare Plan include Bowling Drive, Burlington Mill Road, East and West Young Streets, Pulley Town Road, Rogers Road, and School Street including the proposed School Street extension.

Bowling Drive - It is recommended that Bowling Drive be widened to 24 feet as a part the School Street Extension. Widening would require an additional ten feet of right-of-way. (See School Street Extension.)





Burlington Mill Road - Burlington Mill Road provides service for rural residents. No improvements are recommended at this time.

East Young Street (SR 1003) - East Young Street is the primary east/west radial linking to West Young Street at US 401. Recommendations for the intersection of US 401 and Young Streets (as mentioned under US 401 Existing) include crosswalks, rechannelization, and resignalization of the intersection.

Pulley Town Road (SR 2300) - Pulley Town Road provides primarily rural/residential service in the northeast Rolesville area. No improvements are recommended at this time.

Rogers Road (SR 2052) - Rogers Road provides primarily rural service with some residential service near US 401. The offset intersection of Rogers Road and School Street causes some problems during the morning and afternoon traffic generated by the elementary school. Recommended improvements to School Street should alleviate the problem. (See School Street.) No improvements to Rogers Road are recommended at this time.

School Street - It is recommended that School Street be widened to 24 feet as a part of the School Street Extension. Widening would require an addition 10 feet right-of-way. (See School Street Extension.) Improvements to alleviate the problems caused by the offset intersection of Rogers Road and School Street are currently under construction. Lane markings and street signs clearly marking School Street as a two lane facility are recommended for the existing road. Signs and pavement markings clearly labeling the car and bus loops as one-way at the elementary school will also help to improve traffic flow.

Proposed School Street Extension - The proposed School Street Extension would connect existing School Street and existing Bowling Drive to provide a circulation corridor for the expansion of the elementary school and residential development. The extension would serve as a loop road providing a back entrance to the elementary school. It would also serve to alleviate some of the congestion at the intersection of US 401 and Young Streets by routing southern residents traveling to Raleigh and Louisburg on US 401 away from the downtown intersection. The proposed School Street Extension would be a two lane urban thoroughfare with parking on one side, requiring 34 feet of pavement and 60 feet (total) of right-of-way.

West Young Street (SR 1945) - West Young Street services both existing and planned residential development. It is the primary east/west radial linking to East Young Street at US 401. Recommendations for the intersection of US 401 and Young Streets (as mentioned under US 401 Existing) include crosswalks, a rechannelization of the intersection and resignalization.





#### IV. CONSTRUCTION PRIORITIES

An evaluation of the North Carolina highway program from administrative, historical, and financial perspectives indicates the following objectives are of greatest importance:

- \* To improve the North Carolina arterial system to reduce travel costs and improve travel service between urban centers.
- \* To improve the level of service and safety of all roads and highways on the State system in a cost effective manner.
- \* To encourage economic development.
- \* To preserve the natural and human environment.
- \* To allocate funds to projects in a fair and equitable way.

(1) User benefits, (2) cost, (3) probability that a project will stimulate economic development, (4) quantification of environmental impacts, and (5) relationship of a project to the State arterial system provide a basis for evaluating projects as to how well they meet the objectives.

User benefits include cost savings resulting from an improvement project through reduction in vehicle operating costs, travel time costs, and accident costs.

Estimation of environmental impacts of a project is one of the more difficult evaluations. Environmental factors usually considered in highway project evaluation can be divided into three major categories -- physical, social and/or cultural, and economic environmental considerations (Table 3, 4). Many of these are accounted for when a project is evaluated with respect to user benefits, cost, and economic development potential. However, thirteen environmental factors are generally not considered in these evaluations. They are environmental impacts of a project on (1) air quality (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) park and recreational facilities, (11) historic sites and landmarks, (12) public health and safety, and (13) aesthetics. The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impact of a project.





TABLE 3. ENVIRONMENTAL CONSIDERATIONS

Physical Environment	Social and/or Cultural Environment	Economic Environment
Air quality	Housing	Businesses
Water resources	Neighborhoods	Employment
Soils and geology	Noise	Economic development
Wildlife	Education facilities	Public utilities
Vegetation	Churches	Transportation costs
	Park and recreational facilities	Capital costs
	Public health and safety	Operation and maintenance costs
	National defense	
	Aesthetics	

Thoroughfare improvement needs identified in the Rolesville thoroughfare plan and evaluated are:

- Lane markings clearly showing School Street as a two lane facility
- Crosswalks, a resignalization of lights, and rechannelization at the intersection of US 401 and Young Streets
- Widening of existing US 401 to 44 feet within planning area
- US 401 bypass
- Western Loop between Burlington Mill Road (SR 2051) and Pulley Town Road (SR 2300)
- School Road connector to Bowling Drive
- A widening of School Street and Bowling Drive to 24 feet as a part of the School Street Extension



TABLE 4  
BENEFITS EVALUATION

FAC. & SECTION	ECONOMIC ENVIRONMENTAL POTENTIAL PROBABILITY	DEVELOPMENT IMPACT PROBABILITY	USER BENEFITS PER MILE (MILL \$)
1. Bowling Drive	.12	+0.25 -0.10	11.7
2. School Street	.12	+0.35 -0.25	11.7
3. School St. Ext.	.12	+0.75 -0.00	11.7
4. US 401	.38	+0.45 -0.45	43.1
5. US 401 Bypass	.50	+1.00 -0.55	68.0
6. Western Loop	.25	+0.25 -0.10	164.0

- 
- a/ Estimated probability project will stimulate economic development.  
b/ Probability project will have a positive environmental impact.  
c/ Probability project will have a negative environmental impact.  
d/ Summation of estimated operations, usertime, and accident cost savings. (1988 - 2010)





**TABLE 5**  
**CONSTRUCTION PRIORITIES**

<b>FACILITY &amp; SECTION</b>	<b>DIST (MILES)</b>	<b>TYPE IMPRMT</b>	<b>COST (x 1000)</b>	<b>REC x SEC</b>
1. Bowling Drive	.18	Widening	C 18 R 4	K
2. School Street US 401 - School St. Ext.	.30	Widening	C 30 R 6	K
3. School St. Ext. School St - Bowling Drive	.60	New Loc.	C 360 R 72	K
4. US 401 W. Cordon - Rodgers Road	1.77	Widening	C 832 R 250	H
Bowling Drive - S. Cordon	1.82	Widening	C 855 R 257	H
5. US 401 Bypass US 401-E. - Young St.	1.42	New Loc.	C 2698 R 199	B
E. Young St. - Pulley Town Rd.	1.25	New Loc.	C 2375 R 175	B
Pulley Town Rd. - US 401	0.83	New Loc.	C 1577 R 116	B
6. WESTERN LOOP Burlington Mill - Rodgers Road	.93	New Loc.	C 605 R 121	K
Rodgers Rd. - Young Street	.85	New Loc.	C 553 R 111	K
W. Young St. - US 401	.85	New Loc.	C 550 R 100	K

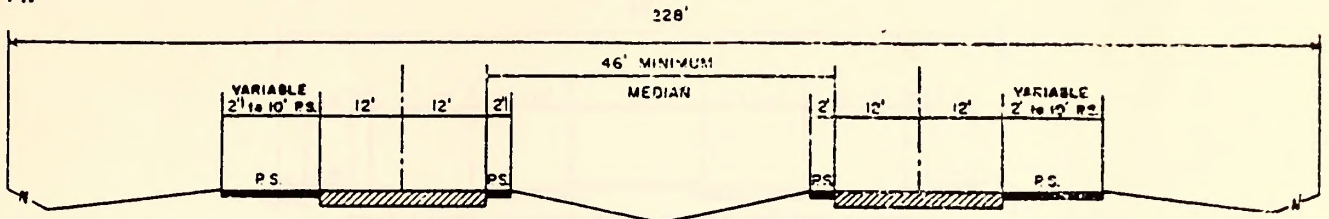
a/ C - Construction cost/R - Right of way cost.





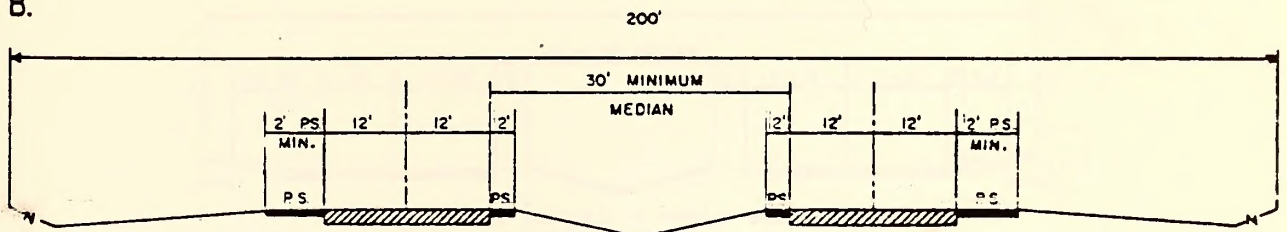
# TYPICAL THOROUGHFARE CROSS SECTIONS

A.



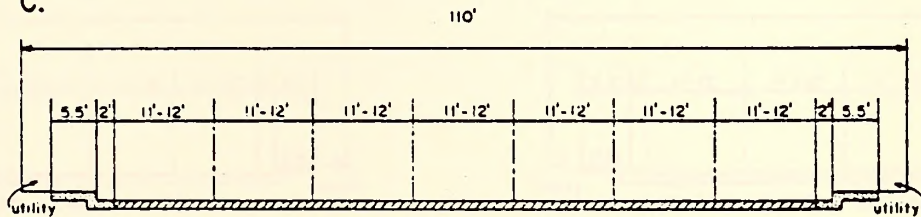
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



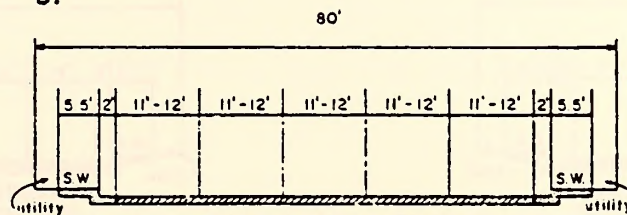
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



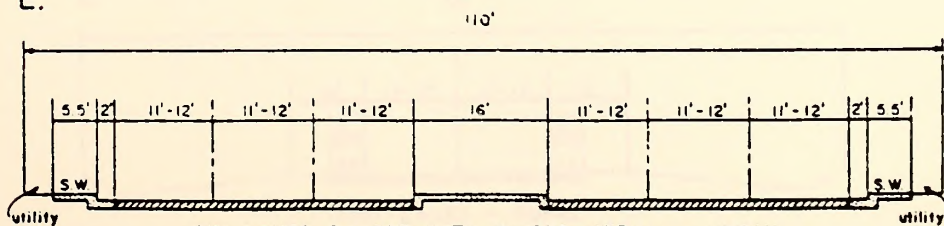
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

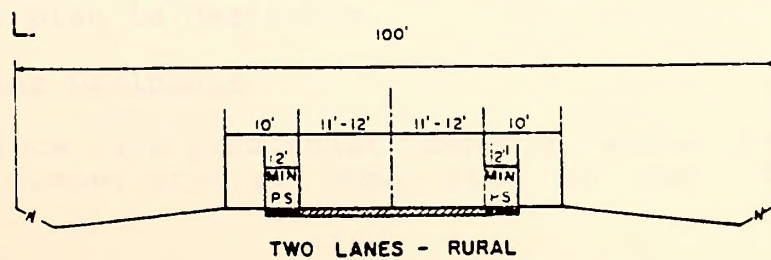
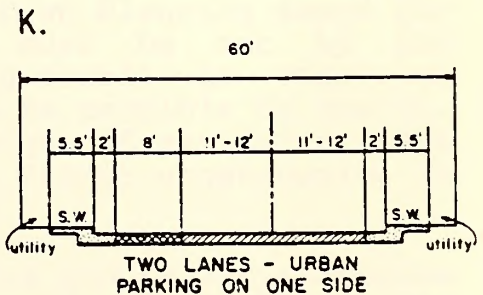
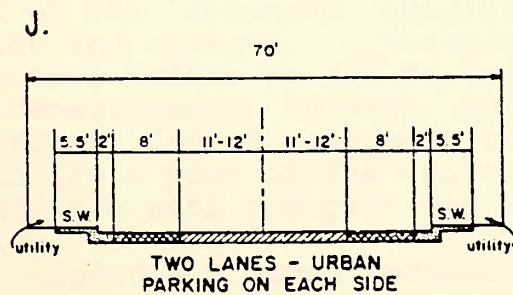
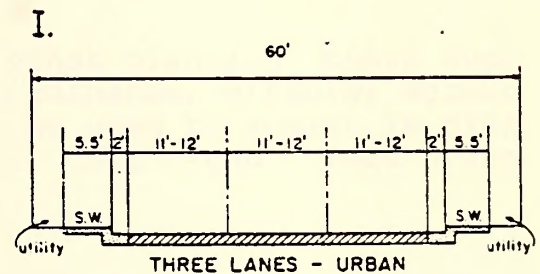
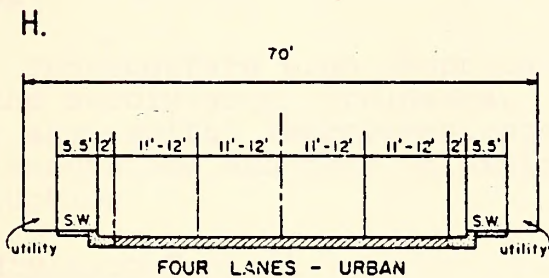
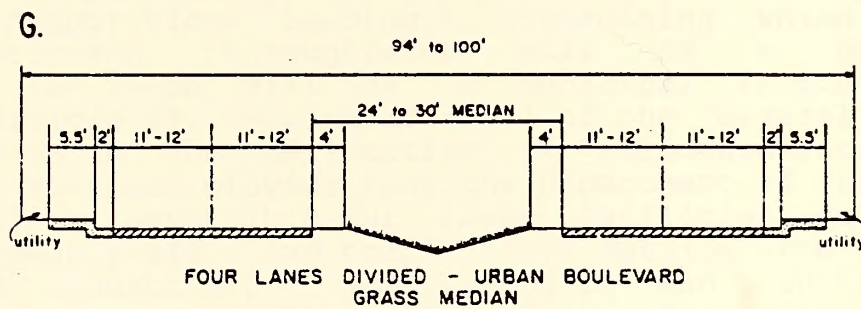
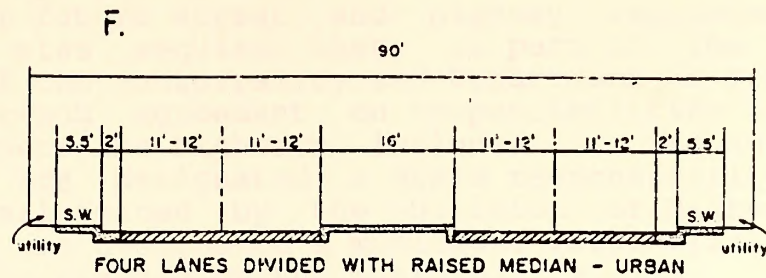
E.



SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN



# TYPICAL THOROUGHFARE CROSS SECTIONS (CONTINUED)







## V. IMPLEMENTATION

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provide that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that, as part of the plan, the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the adopted plan. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways, NCDOT. Facilities which are designated a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations leading to determining which of the existing and proposed thoroughfares will be a Department responsibility and which will be a municipal responsibility. Chapter 136, Article 3A, Section 136-66.1 of the General Statutes provides guidance in the delineation of responsibilities. In summary, these statutes provide that the Department of Transportation shall be responsible for those facilities which serve volumes of through traffic and traffic from outside the area to major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities which serve primarily internal travel.

Thoroughfare plan adoption enables other planning tools such as the subdivision ordinance, zoning ordinance, official street map, and capital improvement program to be used to assist in plan implementation and thus minimize public cost and land use disruption.

### Subdivision Control

A subdivision ordinance requires every subdivider to submit a plot of his proposed subdivision to the Town Planning Board for review and approval. Certain standards must be met by the developer before he can be issued a building permit to construct his development. Through this process, it is possible to obtain, or protect from development the necessary right-of-way for streets which are a part of the thoroughfare plan. Street construction in accordance with the plan can be required.

Appendix B gives recommended definitions and design standards for subdivision ordinances. The Town of Rolesville has extraterritorial subdivision controls. A review of Rolesville's present ordinance to insure it is up-to-date and compatible with the thoroughfare plan is desirable.

### Future Street Line Ordinance

This ordinance is a particular benefit where widening of a street will be necessary at some time in the future. A







municipality with legislative approval may amend its charter to be empowered to adopt future street line ordinances. Through a metes-and-bounds description of a streets future right-of-way requirements, the Municipality may prohibit new construction or reconstruction of structures within the future right-of-way. This approach requires specific design of the facility and would usually require surveys and public hearings to allow affected property owners to know what to expect and to make necessary adjustments without undue hardship. A specific ordinance can be enacted for selected streets.

Recommended thoroughfare projects and other thoroughfares where this tool would be applicable are:

- 1). North & South Main (U.S. 401).
- 2). East & West Young Street (SR 1003, SR 1945).

Recommended right-of-way and ultimate street cross sections for these thoroughfares are given in Appendix A.

### Zoning

A zoning ordinance is beneficial to thoroughfare planning in that planned locations of various land uses and their densities can be realized. This provides a degree of stability on which to forecast travel and to plan the street system.

Other benefits include (1) the establishment of standards of development which will aid traffic operations on major thoroughfares; (2) the minimization of strip commercial development which creates traffic friction and increases the traffic accident potential; and (3) the requirement for provision of off-street parking by new development with the purpose of eventual prohibition of all curb parking on major thoroughfares.

Thoroughfare projects where the zoning ordinance will be important in the protection of the new improved facility are the US 401 Bypass and Western Loop.

### Redevelopment

Redevelopment is the term used to describe efforts toward the removal or rehabilitation of undesirable development. It is one of the few tools available that can be used to correct basic mistakes in the street system such as (1) poor design, (2) poor layout, or (3) too many streets.

### Capital Improvements Program

One of the tools which makes it easy to build a planned thoroughfare system is a capital improvements program. This is a long range plan for the spending of money on street improvements, acquisition of rights-of-way, and other capital improvements within the bounds of projected revenues. Municipal revenues will need to be available for street construction that is a municipal





responsibility, right-of-way cost sharing on projects that are a State responsibility, and advance purchase of right-of-way where such action is appropriate.

#### Development Reviews

Driveway access to a State-maintained street on highway is reviewed by the District Engineer's office and the Traffic Engineering Branch of the Department of Transportation prior to access being allowed. Any development expected to generate large volumes of traffic (e.g. shopping centers, fast food restaurants, large industries, etc.) may be comprehensively studied by a review team or staff from Traffic Engineering, Planning and Research, and Roadway Design Branches of the Department.

If this is done at an early stage it is often possible to significantly improve the developments accessibility at minimal expense. Since the municipality is often the first point of contact for development interests, it is important that the municipality advise developers of this review requirement and cooperate in the review.





## NOTES

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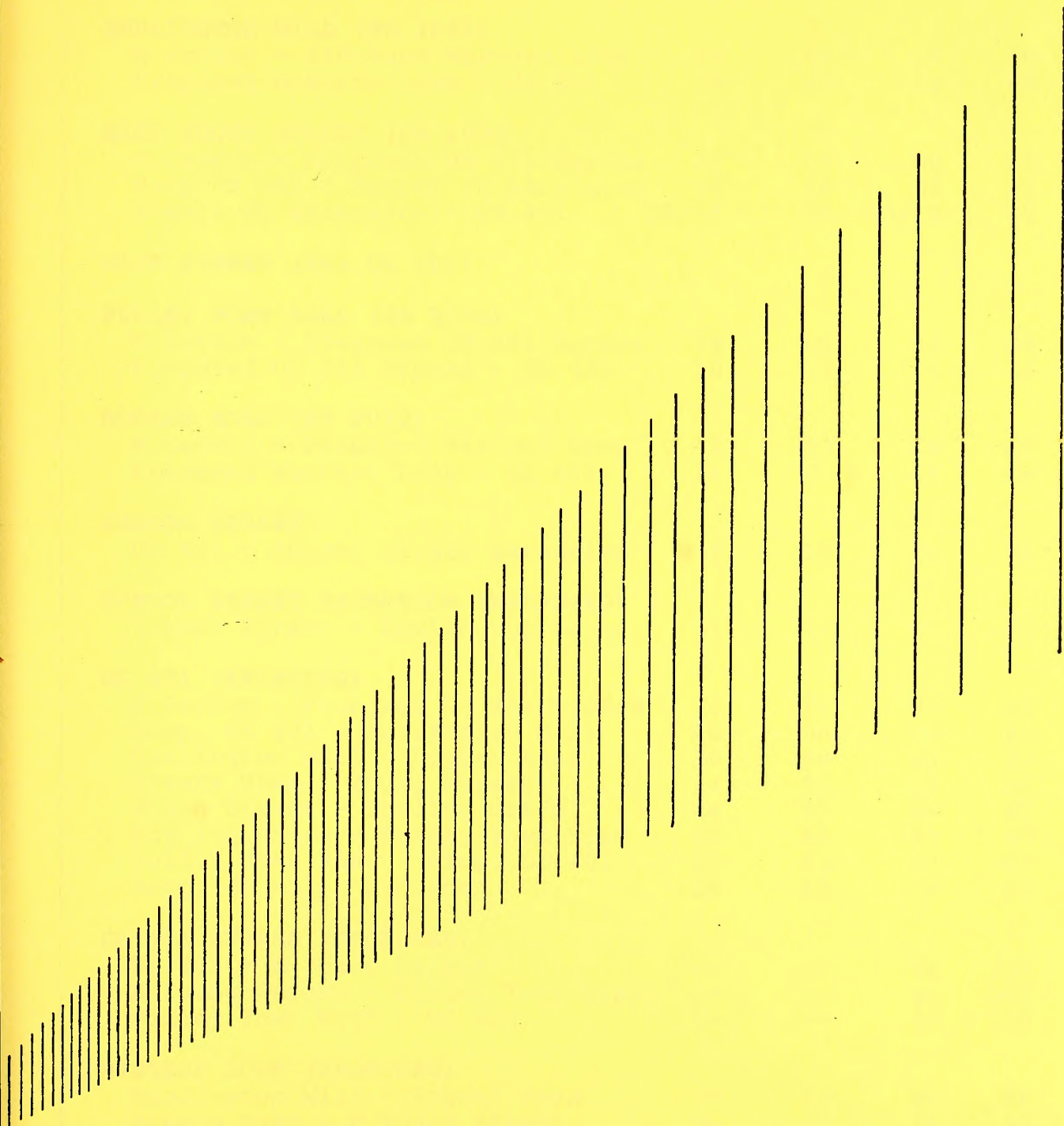
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# APPENDICES







APPENDIX A-TABLE 1 STREET INVENTORY

FACILITY AND SECTION	--EXISTING--		--PROPOSED--		REC
	--X-SECTION--		--X-SECTION--		X-SEC
	RDWY	ROW	RDWY	ROW	
<b>BOWLING DRIVE</b>					
US 401 - School St Extension	16	50	24	60	K
<b>BURLINGTON MILL (SR 2051)</b>					
W Cordon - Proposed Western Loop	18	60	18	60	adq.
Proposed Western Loop - US 401	18	60	18	60	adq.
<b>EAST YOUNG STREET (SR 1003)</b>					
S Cordon - Proposed US 401 Bypass	20	60	20	60	adq.
Prop US 401 - School St Extension	20	60	20	60	adq.
School St Extension - US 401	20/18	60	20/18	60	adq.
<b>MAIN STREET (See US 401)</b>					
<b>PULLEY TOWN ROAD (SR 2300)</b>					
E Cordon - Proposed US 401 Bypass	18	60	18	60	adq.
Proposed US 401 Bypass - US 401	18	60	18	60	adq.
<b>ROGERS ROAD (SR 2052)</b>					
W Cordon - Proposed Western Loop	18	60	18	60	adq.
Proposed Western Loop - US 401	18	60	18	60	adq.
<b>SCHOOL STREET</b>					
US 401 - School Street Extension	16	50	24	60	K
<b>SCHOOL STREET EXTENSION (PROPOSED)</b>					
School Street - Bowling Drive	--	--	34	60	K
<b>US 401 (EXISTING)</b>					
W Cordon - Proposed US 401 Bypass	20	60	44	80	H
Prop. US 401 - Burlington Mill	20	60	44	80	H
Burlington Mill - Rogers Road	20	60	44	80	K
Rogers Road - Young Street	44	60	44	60	adq.
Young Street - Bowling Drive	44	60	44	60	adq.
Bowling Drive - Pulley Town Road	20	60	44	80	H
Pulley Town Road - Prop. US 401	20	60	44	80	H
Prop. US 401 - E Cordon	20	60	44	80	H
<b>US 401 BYPASS (PROPOSED)</b>					
US 401 - E Young Street	--	--	48	300	B
E Young Street - Pulley Town Road	--	--	48	300	B
Pulley Town Road - US 401	--	--	48	300	B
<b>WESTERN LOOP (PROPOSED)</b>					
Burlington Mill - Rogers Road	--	--	36	80	K
Rogers Road - W Young Street	--	--	36	80	K
W Young Street - US 401	--	--	36	80	K
<b>WEST YOUNG STREET (SR 1945)</b>					
US 401 - Proposed Western Loop	20	60	20	60	adq.
Proposed Western Loop - N Cordon	20	60	20	60	adq.





## APPENDIX B

### Recommended Definitions and Design Standards for Subdivision Ordinances

#### Definitions:

##### I. Streets and Roads:

###### A. Rural Roads

1. Principal Arterials - A rural link in a network of continuous routes serving corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.
2. Minor Arterials - A rural link in a network joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement.
3. Major Collector - A road which serves major intracounty travel corridors and traffic generators and provides access to the Arterial system.
4. Minor Collector - A road which provides service to small local communities and links the locally important traffic generators with their rural hinterland.
5. Local Road - A local road that serves primarily to provide access to adjacent land and for travel over relatively short distances.

###### B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Interstate, other freeway, express-way, or parkway links, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
2. Minor Thoroughfares - Minor thoroughfares are important streets in the city system and perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating a minor through-traffic movement and may also serve abutting property.





3. Local Street - A local street is any link not on a higher-order urban system and serves primarily to provide direct access to abutting land and access to higher systems.

C. Specific Type Rural or Urban Street

1. Freeway, expressway, or parkway - Divided multi-lane roadways designed to carry large volumes of traffic at relatively high speeds. A freeway is a divided highway providing for continuous flow of vehicles with no direct access to abutting property or streets and with access to selected crossroads provided via connecting ramps. An expressway is a divided highway with full or partial control of access and generally with grade separations at major intersections. A parkway is a highway for non-commercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park-like development.
2. Residential Collector Street - A local access street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.
3. Local Residential Street - Cul-de-sacs, loop streets less than 2500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.
4. Cul-de-sac - A short street having but one end open to traffic and the other end being permanently terminated and a vehicular turnaround provided.
5. Frontage Road - A local street or road that is parallel to a full or partial access controlled facility and functions to provide access to adjacent land.
6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

- A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.





- B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.
- C. Lot - A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".
  - 1. Corner Lot - A lot abutting upon two streets at their intersection.
  - 2. Double-Frontage Lot - A continuous (through) lot which is accessible from both of the parallel streets upon which it fronts.
  - 3. Reverse-Frontage Lot - A continuous (through) lot which is accessible from only one of the parallel streets upon which it fronts.

### III. Subdivision

- A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.
- B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, whether immediate or future, of sale or building development, and all divisions of land involving the dedication of a new street or a change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved, (3) the public acquisition by purchase of strips of land for the widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.
- C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. Since a transfer of property is involved, the dedication is made by written instrument and is completed with an acceptance.





- D. Reservation - A reservation of land does not involve any transfer of property rights. It simply constitutes an obligation to keep property free from development for a stated period of time.

## Design Standards

### I. Streets and Roads:

The design of all State maintained streets and roads within Rolesville shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway and Transportation Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the requirements of the thoroughfare plan for Rolesville as adopted by the Town of Rolesville and the North Carolina Department of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted Rolesville Thoroughfare Plan. the rural planning area shall be that area outside the urban planning boundary.

- A. Right-of-Way Widths: Right-of-way widths shall not be less than the following and shall apply except in those cases where right-of-way requirements have been specifically set out in the Thoroughfare Plan.

1. Rural	Min. Right of Way, Ft.
a. Principal Arterial	
Freeways	350
Other	200
b. Minor Arterial	100
c. Major Collector	100
d. Minor Collector	100
e. Local Road	*60

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\*The desirable minimum right-of-way is 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate on local residential streets.





Min. Right of Way, Ft.

2. Urban
  - a. Major Thoroughfare Other than Freeway and Expressway 90
  - b. Minor Thoroughfare 70
  - c. Local Street \*60
  - d. Cul-de-sac \*\*Variable

the subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for an access controlled facility, the subdivider will only be required to make a reservation.

A partial width right-of-way, not less than sixty (600) feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivided; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. Street Widths: Widths for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential
  - a. Curb and gutter section 26 feet, to face of curb
  - b. Shoulder section 20 feet to edge of pavement, 4 foot shoulders
2. Residential Collector
  - a. Curb and gutter section 34 feet, face to face of curb
  - b. Shoulder section 20 feet to edge of pavement, 6 foot shoulders

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\* The desirable minimum right-of-way is established as 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate.

\*\* the right-of-way dimension will depend on radius used for vehicular turnaround. Distance from edge of pavement of turnaround to right-of-way should not be less than distance from edge of pavement to right-of-way on street approaching turnaround.

C. Geometric Characteristics: The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway system or Municipal Street





System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

## 1. Design Speed

The design speeds for subdivision type streets shall be:

	Desirable	(Minimum)		
		Level	Rolling	Mountainous
Rural				
Minor Collector Roads	60	(50)	(40)	(30)
Local Roads including Residential Collectors and Local Residential	50	(50) *	(40) *	(30) *
Urban				
Major Thoroughfares Other than Freeway or Expressway	60	(50)	(50)	(50)
Minor Thoroughfares	60	(50)	(50)	(40)
Local Streets	40	(40) **	(30) **	(20) **

## 2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

Design Speed	Level	Rolling	Mountainous
60	2	4	6
50	4	5	7
40	5	6	8
30		9	10
20			12

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\*Based on projected annual average daily traffic of 400-750. In cases where road will serve a very limited area and small number of dwelling units, minimum design speeds can be reduced further.

\*\*Based on projected annual average daily traffic of 50-250.

b. A minimum grade for curbed streets normally should not be less than 0.5%, a grade of 0.35% may be allowed where there is a high type pavement accurately crowned and in areas where special drainage conditions may control.





- c. Grades for 100 feet each way from intersections should not exceed 5%.
- d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 150% greater.

### 3. Minimum Sight Distances

In the interest of public safety, no less than the minimum sight distance applicable shall be provided in every instance. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters. (General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case):

<u>Design Speed, MPH</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>	<u>60</u>
Stopping Sight Distance					
Min. Distance, Ft.	150	200	275	350	475
Des. Distance, Ft.	150	200	300	450	650
Min. K* Value For:					
Min. Crest Curve	16	28	55	85	160
Des. Crest Curve	16	28	65	145	300
Min. Sag Curve	24	35	55	75	105
Des. Sag Curve	24	35	60	100	155

### Passing Sight Distance

Min. Passing Distance, Ft. (2 lane)	1100	1500	1800	2100
Min. K* Value For Crest Vertical Curve	365	686	985	1340

Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984".

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\*K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide minimum sight distance.

- 4. The following table shows the maximum degree of curve and related maximum superelevation (e) for rural roads with no curb and gutter is .08. The maximum rate of superelevation for urban streets with curb and gutter is .06 with .04 being desirable.





Design Speed MPH	Maximum e*	Minimum Radius (Rounded) Feet	Maximum Degree of Curve (Rounded) Feet
20	.04	125	45.0
30	.04	300	19.0
40	.04	560	10.0
50	.04	925	6.0
60	.04	1410	4.0
20	.06	115	50.0
30	.06	275	21.0
40	.06	510	11.0
50	.06	830	7.0
60	.06	1260	4.5
20	.08	110	53.5
30	.08	250	23.0
40	.08	460	12.5
50	.08	760	7.5
60	.08	1140	5.0

\*e = rate of roadway superelevation, foot per foot

#### D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty (60) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
3. Off-set intersections are to be avoided unless exception is granted by the Division of Highways for intersections involving the State Highway System, or the Planning Board for intersections involving only the municipal street system. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.





E. Cul-de-sacs

Cul-de-sacs, unless exception is granted by the local planning board, shall not be more than five hundred (500) feet in length. The distance from the edge of pavement on the vehicular turnaround to the right-of-way line should not be less than the distance from the edge of pavement to the right-of-way lone on the street approaching the turnaround. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access.

Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least twenty (20) feet.
3. Deadend alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turnaround facilities at the deadend as may be approved by the Planning Board.
4. Sharp changes in alignment and grade shall be avoided.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. the application is available at the office of the nearest District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. In streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.





## I. Wheel Chair Ramps

In accordance with Chapter 136, Article 2A, Section 136-44.14, all street curbs in North Carolina being constructed or reconstructed for maintenance purposed, traffic operations, repairs, correction of utilities, or altered for any reason after September 1, 1973, shall provide wheelchair ramps for the physically handicapped at all intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Division of Highways, Publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons".

## J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

- a. Shoulder Section Approach

- i. Under 800 ADT Design Year

Minimum 28 feet width face to face of parapets or rails, or pavement width plus 10 feet, whichever is greater.

- ii. 800-2000 ADT Design Year

Minimum 34 feet width face to face of parapets or rails, or pavement width plus 12 feet, whichever is greater.

- iii. Over 2000 ADT Design Year

Minimum 40 feet  
Desirable 44 feet width face to face of parapets or rails.

- b. Curb and Gutter Approach

- i. Under 800 ADT Design Year

Minimum 24 feet face to face of curbs.

- ii. Over 800 ADT Design Year

Width of approach pavement measured face to face of curbs.





Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:
  - a. Shoulder Section Approach - Width of approach pavement plus width of usable shoulders on the approach left and right.  
Minimum 8 feet  
Design 10 feet
  - b. Curb and Gutter Approach - Width of approach pavement measured face to face of curbs.



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